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Application of: John A. Sollars
Serial Number: 10/696,757
Filed: October 29, 2003
For: **Inflatable Airbag and Method of Making the Same**
Group Art Unit: 3616
Examiner: Culbreth, Eric D.

Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

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Date: May 14, 2008
Signature: Linda - Ann Manley
Name: Linda - Ann Manley

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant respectfully submits the enclosed Appeal Brief pursuant to 37 C.F.R. § 41.37 and requests the Examiner's rejection of claims be reversed and that the application be remanded to the Examiner for allowance.

MAY 14 2008**I. REAL PARTY IN INTEREST**

The assignee Milliken & Company is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claims 10, 13-16, 18, 22-23, and 37-41 are currently rejected and presented for appeal. Claims 1-9, 11-12, 17, 19-21 and 24-36 have been canceled.

A Preliminary Amendment was filed on October 29, 2003 canceling original claims and submitting instead claims 10 - 35.

By Amendment dated September 16, 2005 several claims were amended, and claims 17, 21 and 26-28 were canceled. New claims 36-38 were added.

Another Amendment filed on January 24, 2006 amended claims 10, 24, 25 and 36.

A Response filed on February 28, 2006 amended claims 10, 24, 25 and 36.

A Response filed on September 21, 2006 canceled claims 1-9, 17, 21, 24-36.

An Amendment was filed on April 12, 2007. Claims 1-9, 11-12, 17, 19-21, and 24-36 were canceled. New claims 39-41 were added.

Claims 10, 13-16, 18, 22, 23, and 37-41 were rejected in a final rejection on July 12, 2007.

A Response was filed on October 31, 2007 with a Request for Continuing Examination presenting pending claims 10, 13-16, 18, 22-23, 37-41.

Claims 10, 13-16, 18, 22-23, and 37-41 are currently rejected in an office action mailed on January 24, 2008, and these rejected claims 10, 13-16, 18, 22-23, and 37-41 now are presented for appeal. Claims 1-9, 11-12, 17, 19-21 and 24-36 have been canceled and are not presented for appeal.

IV. STATUS OF AMENDMENTS

An action rejecting the claims was issued on June 16, 2005. Later, a Request for Continuing Examination and a Response was submitted on February 28, 2006. A Final Action rejecting the claims was issued on April 21, 2006. On April 12, 2007 additional amendments were made to claim 10, 13, 18, 23. A Response was filed on October 31, 2007 in which the claims were not amended, but were restated. At that time, further argument and declaratory evidence was submitted. Another office action rejecting the claims was mailed on January 24, 2008. No further amendments have been made to the claims since that time.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to an inflatable airbag cushion having multiple fabric layers and closely spaced woven in joints that resist gas permeation. Page 9, line 20 to Page 11, line 2. Crossover yarn configurations may be employed as well, which achieve an advantageously tight gas seal at the

woven in joints. Pages 12-16; see also page 14, lines 20-25 and page 15, lines 10-20; see also Figures 5-6.

Independent claims 10, 18 and 23 are the only independent claims on appeal. These claims describe an inflatable airbag cushion having multiple layers and closely spaced interconnected joints. Page 9, line 20 to Page 11, line 2. The joints are separated by no more than about four yarns between the first and second interconnected joints in the embodiment of claim 10, in the most preferred practice. Page 15, line 15-16. Further, the joints are defined by crossover yarns alternating from a position in the first layer to a position in the second layer, wherein a plain weave is maintained across each of the interconnected joints. Pages 12-16; see also page 14, lines 20-25 and page 15, lines 10-20; see Figures 5-6. In the embodiment of claim 18, the number of yarns between joints is about two to four yarns. Page 15, line 16. In claim 23, the first direction is in the weft direction of the fabric, and the second direction is in the warp direction of the fabric. Pages 4-5.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 10, 13-16, 18, 22-23 and 37-41 are patentable under 35 U.S.C. §103(a) in light of Japanese Patent Disclosure 50-145875 (herein "Japanese 875 Patent" or "Japanese 875 disclosure", or "Japanese 875").

VII. ARGUMENT**Rejections under 35 U.S.C. § 103(a) over the Japanese 875 Patent**

Claims 10, 13-16, 18, 22-23 and 37-41.

The present invention relates to an inflatable airbag cushion having multiple fabric layers and closely spaced woven in joints that resist gas permeation. Crossover yarn configurations may be employed, which achieve an advantageously tight gas seal at the woven in joints. This can be seen in Figures 5 and 6, which shows one embodiment having four yarns per side (or per layer) between the woven in closely spaced joints 16 in Figures 5-6.

Independent claims 10, 18 and 23 are the independent claims on appeal. These claims call for an inflatable airbag cushion having multiple layers and closely spaced interconnected joints. The joints are separated by no more than about four yarns between the first and second interconnected joints in the embodiment of claim 10, which is the most preferred practice. (See specification, page 15, lines 15-16). Further, the joints are defined by crossover yarns alternating from a position in the first layer to a position in the second layer, wherein a plain weave is maintained across each of the interconnected joints. Such crossover yarns are shown for example in Figures 5 and 6, where, reading from the left side of the Figure, the yarns "cross" from top layer 30 down to bottom layer 32 in between the woven in joints 16, and then back to the top layer 30. It has been found by the inventor that such an arrangement forms a very tight gas seal, which is important in the practice of the invention. In the embodiment of claim 18, the number of yarns between joints is about two to four

yarns. Page 15, line 16. In claim 23, the first direction is in the weft direction of the fabric, and the second direction is in the warp direction of the fabric. Page 4-5.

Test Data. Quantitative results have been produced showing unexpected results and superiority of the claimed invention as compared to prior art. See Evidence, Appendix IX herein. Applicant has conducted testing to prove unpredictable and unexpected results by comparative testing of the invention to the embodiments that represent the cited prior art of the Japanese 875 Patent. The Declaration of John A. Sollars, Jr. provided in the Evidence Appendix IX herein ("Sollars Declaration") shows actual test data proving the superiority of reducing the number of yarns between interconnected joints. This data directly compares the invention to samples made according to the arrangement in the Figure 2 of the prior art reference Japanese 875 cited in the Office Action. The test data shows the unpredictable and unexpected results of the invention, which rebuts the rejection for obviousness.

No Obviousness In Light of Section 103(a). It would not be obvious for one of ordinary skill in the art, at the time the invention was made, to modify the teachings of the Japanese 875 utility model to make the invention as claimed. The inventor in this instance discovered that by significantly reducing the number of yarns in the region between interconnected joints, it was possible to substantially improve air retention in airbag structures using a modified seam with modified yarn arrangement. This discovery was unpredictable and

unexpected. There is no teaching in the cited art of reducing the yarns in a region between interconnected joints. There is no such teaching in the Japanese 875 utility model. In fact, there are contrary teachings in the prior art. At least one prior art reference teaches away from a reduction in the number of yarns between interconnected joints.

The Invention. The invention, in one embodiment, includes an airbag cushion structure of interconnected woven in joints that resist gas permeation, the structure having between the first and second interconnected joints 2-4 yarns in the first layer and 2-4 yarns in the second layer. Thus, in the invention, woven in joints are provided with a two-layer total of between 4 and 8 yarns per two-layer structure between joints, i.e. counting both the top and bottom layers between interconnected joints. One such embodiment of the invention is illustrated in the patent application in Figures 5-6. The use of closely spaced joints is useful in forming flow barrier elements in the airbag cushion, as described on page 15 of the patent application specification. It has been found that the use of such a structure in airbags of the invention resist gas leakage, and therefore retain gas pressure for longer periods of time. Sollars Declaration, paragraph. 4.

Japanese 875 Patent. John Sollars, the inventor, reviewed Japanese Utility Model 50 [1975] - 145875 to Katsutoshi Ando et al. (hereafter "the Japanese 875 patent"). Figure 2 of the Japanese 875 cited prior art is an airbag

with a weave that includes twelve total (12) yarns, the structure having six (6) yarns in each layer of a two layer structure, between interconnected joints, for a total of 12 yarns between joints. Sollars Declaration, para. 5.

Actual Testing. The inventor, John Sollars, conducted testing of the seams of the invention, as compared to seams as shown and disclosed in the Japanese 875 patent. Sollars Declaration, para. 6. He made special airbags using the so-called "cross-over" seam of the invention, having interconnected joints as described and claimed in the patent application. Airbags were made with 4 total yarns (2 per side) between interconnected joints as a representative example of the invention. Furthermore, other comparative airbags were made in the same manner, but with 12 total yarns (6 per side) between interconnected joints to represent the Japanese 875 patent embodiments. Sollars Declaration, para. 6. The pressure readings on the Y-axis of the graphs of Figure 1-2, attached to the Sollars Declaration, represent the pressure experienced in the airbag over time, after pressure is applied to the airbag seam. Results are seen in Figure 1, Sollars Declaration. The full size airbag was tested at a higher, more rigorous pressure, as shown in Figure 2. Sollars Declaration, para. 6.

Unexpected and Unpredictable Results. In all instances, the airbags having seams with 12 yarns between interconnected joints, or 6 per side (See Figure 2 of Japanese 875) undesirably leaked down to a lower pressure faster as compared to the leak down rate of the seams of airbags that employed the

invention. Sollars Declaration, para. 7. It is more desirable, and the airbag of greater value in the market, if the airbag retains air pressure as long as possible. Sollars Declaration, para. 7. A seam type that will retain pressure longer will allow the use of less coating material to achieve the required and specified leak down requirement. This savings of material translates in to product cost savings and economic advantage. These tests results are unexpected. See Sollars Declaration, para. 7.

Substantial Improvement. The invention, in one laboratory test, showed a 22% improvement in performance compared to the sample made in a manner that is similar to the Japanese 875 prior art. Sollars Declaration, para. 8. This advantage of the invention shows even a higher relative difference at the typical 5-6 second time interval required in the industry, i.e. the seams of the invention compared to the seams shown in the Japanese 875 teachings. Sollars Declaration, para. 8. For example, the data showed when tested at 10.15 psi airbag pressure, at 5 seconds of elapsed time, for a full size bag, a 12 yarn wide seam showed 6.24 psi. At 5 seconds of time for the 4 yarn seam (invention), the pressure value of 7.61 was recorded. This is an increase in performance for the 4 yarn seam/airbag of the invention of about 22% improvement compared to the Japanese 875 sample. This is very significant!

34% Percent Improvement at Elevated Test Pressure. In another example tested on actual full size airbag cushions, the invention showed a 34%

improvement when compared to the prior art Japanese 875 sample Sollars Declaration, para. 9. In this industry, a 34% improvement is substantial and significant. The higher and more rigorous starting pressure, as shown in Figure 2, of 14.5 psi, causes even greater shifting of the yarns in the undesirable Japanese 875 sample, with undesirable gas leakage through the seam of the Japanese sample. Sollars Declaration, para. 9. Further, at the 14.5 psi starting pressure, at 5 seconds, the percent improvement was about 34% when comparing the 4 total yarn seam of the invention to the 12 total yarn seam of the Japanese 875 embodiment. These are significant and unexpected results in the difference in the ability of these two samples to retain applied gas pressure when used in an airbag. Sollars Declaration, para. 9. The results are due to the discovery which embodies the new seaming arrangement.

This is very significant! There is no factual evidence in the record to rebut the clear technical findings of this testing. Further, there are no facts in the record which rebut the testimony of Sollars that the results are unpredictable and unexpected.

No Motivation. There is no motivation expressed in the Japanese 875 patent for changing the number of yarns as displayed in Figure 2 or Figure 4 of Japanese 875 to reduce the number of yarns in both of these layers. There is simply no cited teaching in the art for changing the structure of Japanese 875 to conform to the claimed invention, and the only source applicant has found for a motivation to make such a change is the hindsight reconstruction by the Office

Action -- that is -- intentionally modifying the prior art to conform it to meet the stated and disclosed structure of the claimed invention, using the claimed invention as a guide in making such a theoretical modification. This type of hindsight reconstruction which uses as a guide the applicant's claimed invention is insufficient to establish obviousness under Section 103(a). In fact, it is legally insupportable.

The Japanese 875 reference is very brief in its disclosure. It shows one-half of one page of text, and a few simple figures. The text appears to say nothing about providing an improved seam for resisting air leakage, and there apparently is nothing in the reference that would suggest that the six yarns per layer in Figure 2 would or would not have any effect on retained gas pressure if such a seam structure were used in an airbag. There is no reason for a person of skill in the art to look to this reference for a weave or seam arrangement when searching for a seam that will resist leakage under pressure conditions. The reference teaches instead the use of "connecting parts", which has no applicability to the present invention, or to air leakage.

The seam of the invention is most useful in side curtain airbags, which require high gas pressures for relatively long periods of time. Side curtain bags must retain pressure for 5-8 seconds, which is 50-100 times longer than the conventional airbags of the 1970's. The prior art Japanese 875 reference, due to its age dating from 1975, could not possibly refer to the modern high pressure side curtain airbags, but instead would most likely apply to conventional frontal impact type airbags -- which have very little or no gas pressure retention

requirements. Thus, this reference was not directed to solving the problem of the invention, that is, gas retention.

No Prima Facie Case. There is no *prima facie* case of obviousness, since the claimed reference does not teach all the elements of the claimed invention. In the invention, it has been found that an inflatable airbag cushion may be constructed that employs multiple fabric layers having relatively closely spaced interconnected woven in joints. This structure has been found by the inventors to desirably resist gas permeation across the joints. That is, in the practice of the invention, there is a first interconnected joint and a second interconnected joint. The first and second interconnected joints run generally parallel to each other. The first and second interconnected joints each form a woven union of said first and second woven fabric layers along the length of the interconnected joints. The number of yarns positioned between said first and second interconnected joints in the practice of the invention is no more than about four yarns in each of the first and second layers. It has been found that using no more than about four yarns in both the first and second layers resists gas permeation across the joint, which is highly desirable in airbag performance. Thus, this structural feature is especially advantageous in the gas retention characteristics of the airbag cushion, and there is no recognition of this structure or its performance advantage in the cited reference.

Japanese 875 is Insufficient. The Japanese 875 patent does not teach using no more than four yarns in a first layer. Further, the Japanese 875 patent

does not teach using no more than four yarns in the second layer. Thus, this prior art reference does not provide a *prima facie* case of obviousness, since the feature of having a reduced number of yarns in this region with four yarns or less, or even between 2 and 4 yarns per side --- is completely missing from the Japanese 875 reference.

The Specification is Clear and Specific. The specification indicates clearly the advantages of the airbag structure of the invention. On page 4, lines 21-22 of the disclosure, the inventive cushion structure is stated to "retain gas pressure for a prolonged period of time after inflation". Likewise, Figure 5 and 6 are disclosed as particularly preferred embodiments of the invention (see page 7, lines 15-21), and Figures 5 and 6 show no more than four yarns in both the first and second woven fabric layers. Further, on page 15, lines 15-17, the specification indicates: "In the most preferred practice only about two to four yarns in each layer of fabric will be disposed in the region between the closely spaced joints (FIGS. 5 and 6)". Further, it is stated: "The use of very closely spaced joints is believed to be particularly useful in forming the flow barrier elements 14 which define the perimeter of the cushion." Page 15, lines 22-23. To achieve closely spaced joints, one preferably may use no more than four yarns in the first and second woven fabric layers. Thus, it is evident in the applicant's specification that the use of closely spaced joints, with a minimized number of yarns between the joints, assists in the retention of gas pressure and structure of flow barrier elements in the practice of the invention.

Prior Art Teaches Away From Invention. In fact, some prior art teaches

away, i.e. teaches in favor of *increasing* the number of yarns between joints. This adds further to the fact that this invention was unpredictable to one of skill in the art. That is, the use of a crossover yarn which begins in one layer and "crosses over" to a second layer is shown, for example in U.S. Patent No. 3,991,249 to Yamashita et al. Figure 1D of this Yamashita patent (which was cited in applicant's Information Disclosure Statement of May 10, 2004) shows a "crossover" yarn 4a that is used for forming the face fabric of the tubular weave portion 1. This yarn 4a is also used in the Yamashita disclosure for forming the back fabric of small weave portion 2a. Figure 1A illustrates a woven airbag material with a plurality of stitched portions 2 formed at a position between two adjacent tubular weave portions 1. The length of each small tubular weave portion 2a and 2b is a full 2 centimeters. See column 6, lines 5-8. This prior art patent suggests using a great number of yarns (i.e. several centimeters in woven width) between the points at which crossover occurs in an airbag fabric. Thus, this teaching of Yamashita counsels in favor of using substantially more yarns (i.e. orders of magnitude more!) than is shown in Japanese 875 in such the intermediate zone between tubular weave portions. This Yamashita reference, therefore, counsels in favor of using much more than a maximum of four yarns in the region between joints. This makes it even more likely that a person of skill in the art would be led to go against its teaches in reducing the number of yarns between joints.

No Suggestion in Japanese 875. There is no suggestion in Japanese 875 to alter the structure of the airbag shown in that reference to change the

number of yarns employed in that structure. The only suggestion found is invented in the language of the Office Action, and in response to review of applicant's invention and specification. This sort of hindsight reconstruction of prior art to try and conform or change the structure of the prior art to approximate that of the disclosed invention is *not* an appropriate manner of approaching obviousness under Section 103.

Rejection on the Basis of Unclaimed Embodiments is Improper. The Office Action states that the test data results are not persuasive because "applicant also teaches using more than 4 yarns.... for each layer" in other disclosed embodiments. This argument that the data is somehow "unpersuasive" simply because data was not generated for certain disclosed but unclaimed embodiments has no basis in the law. There is no legal basis for arguing a lack of unexpected results, in the face of clear evidence to the contrary, simply because certain unclaimed embodiments (which are not at issue here) may not have been tested during the experiments.

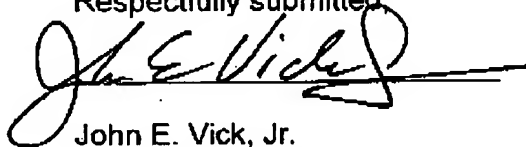
There is no requirement in the law to prove that all embodiments disclosed but currently unclaimed in Applicant's specification perform in a similar manner. Applicant has claimed embodiments using no more than four yarns in the first layer and no more than four yarns in the second layer (claim 10, for example). This refers to a maximum of four yarns per side. Other independent claims 18 and 23 for "two to four yarns" for each of the first and second layers, i.e. they are directed to two to four yarns *per side*.

There is no requirement to test every single embodiment within the scope of the claim. That is, there is no requirement to test two yarns per side, three yarns per side, and four yarns per side. The test data directed to two yarns per side is directed to an embodiment that is within all of the independent claims on appeal here, and is entirely appropriate. This is sufficient to show unexpected results in light of the prior art structure. There is no legal requirement to test all points in a range, and the results still are unexpected, even if applicant has not tested each and every point in the range. A person of skill in the art could easily recognize the value of the results in proving the superiority of the claimed invention as compared to the cited prior art.

Summary. Applicant respectfully submits that independent claims 10, 18 and 23 are patentable over the cited references. If an independent claim is non-obvious under 35 U.S.C. §103(a), then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988). All of the dependent claims in Applicant's application depend either directly or indirectly from one of the two previously mentioned independent claims that are non-obvious under §103(a).

Applicant therefore respectfully submits that claims 10, 13-16, 18, 22-23, and 37-41 are patentable, and are not properly rejected under 35 U.S.C. §103(a), in view of the cited prior art. Applicant respectfully submits that the rejections of claims should be reversed, and that these claims should be allowed to issue in a United States Patent.

Respectfully submitted



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VIII. CLAIMS APPENDIX**Claims 1-9 (Canceled)**

10. (Previously Presented) An inflatable airbag cushion having multiple fabric layers and closely spaced interconnected woven in joints that resist gas permeation, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of yarns running in a first direction, a weft direction, and a plurality of yarns running in a second direction, a warp direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel to each other, said first and second interconnected joints each forming a woven union of said first and second woven fabric layers along the length of said interconnected joints, the number of yarns positioned between said first and second interconnected joints being no more than four yarns in said first layer and no more than four yarns in said second layer;

(c) at least some of said weft yarns comprising crossover yarns, crossover yarns of said first layer switching from a position within said first layer to a position within said second layer at said first interconnected joint, said crossover yarns further switching from a position within said second layer to a position within said first layer at said second interconnected joint; and

(d) wherein said crossover yarns are substantially free of floats at said interconnected joints.

11-12. (Canceled).

13. (Previously Presented) The airbag cushion of claim 10 wherein the number of said yarns positioned between said joints is between about two and four yarns for each of said first and second layers.

14. (Original) The airbag cushion of claim 10 wherein said crossover yarns are provided in a plain weave configuration that extends across said joints.

15. (Previously Presented) The airbag cushion of claim 10 wherein in the weft direction each of said crossover yarns passes alternately over and under each of successive warp yarns in each of said joints.

16. (Original) The inflatable airbag cushion of claim 13 wherein said crossover yarns are provided in a plain weave.

17. (Cancelled).

18. (Previously Presented) An inflatable airbag cushion having multiple layers and closely spaced interconnected woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of first yarns extending in a first direction and a plurality of second yarns extending in a second direction, said second direction being perpendicular to said first direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints extending generally parallel to each other, said first and second interconnected joints each forming a woven seam joining said first and second woven fabric layers along the length of said interconnected joints, wherein the number of yarns positioned between said first and second interconnected joints is about two to four yarns in each of said first and second layers,

(c) wherein said joints are defined by yarns alternating from a position in said first layer to a position in said second layer, wherein said yarns are provided in a plain weave, said plain weave being maintained across each of said interconnected joints.

19-21. (Canceled).

22. (Previously Presented) The inflatable airbag cushion of claim 18 wherein said first and second layers are generally free from yarn interconnections at locations which are between said first and second interconnected joints.

23. (Previously Presented) An inflatable airbag cushion comprising a woven fabric of dobby construction, said fabric comprising an inflating portion, wherein said airbag cushion comprises woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of first yarns running in a first direction and a plurality of second yarns running in a second direction, said second direction being perpendicular to said first direction, said first direction being in the weft direction across the fabric and said second direction being provided in the warp direction upon said fabric;

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel and in the weft direction, said first and second interconnected joints each forming a woven seam joining said first and second woven fabric layers along the length of said interconnected joints, wherein the number of first yarns running in the weft direction positioned between said first and second interconnected joints is between about two and four yarns for each of said first and second layers, and

(c) said second yarns alternating from a position in said first layer to a position in said second layer, further wherein said second yarns are provided in a plain weave, said plain weave being maintained by said second yarns across said interconnected joints.

24-36. (Canceled)

37. (Previously Presented) The cushion of Claim 10, wherein said first and second interconnected joints run in the warp direction.

38. (Previously Presented) The cushion of Claim 10, wherein said first and second interconnected joints run in the weft direction.

39. (Previously Presented) The cushion of claim 10 wherein the number of yarns between said first and second interconnected joints is no more than two yarns in said first layer and no more than two yarns in said second layer.

40. (Previously Presented) The cushion of claim 18 wherein said first and second interconnected joints comprise no more than two yarns in each of said first and second layers.

41. (Previously Presented) The cushion of claim 23 wherein said number of first yarns running in the weft direction between said interconnected joints is no more than two yarns said first layer and no more than two yarns in said second layer.

IX. EVIDENCE APPENDIX

The Declaration of John Sollars and its attachments Figures 1 and 2 were entered into the record and submitted to the Patent Office on October 31, 2007 in connection with a filing of a Request for Continuing Examination. The Examiner accepted it into the record, and the examiner discusses the evidence in the subsequent Office Action mailed January 24, 2008, on pages 3-4.

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Case No.: 2056B

MAY 14 2008**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of: Sollars

Serial Number: 10/696,757

Filed: October 29, 2003

For: **INFLATABLE AIRBAG AND METHOD OF MAKING THE SAME**

Group Art Unit: 3616

Examiner:

Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450**Certificate of Fax Transmission**

I hereby certify that this correspondence, and all correspondence referenced herein as being sent by fax to the US Patent Office to General Fax No. 571-273-8300.

Date: October 31, 2007Signature: Linda Ann ManleyName: Linda Ann Manley**DECLARATION OF INVENTOR**
JOHN A. SOLLARS, JR.

1. I, John A Sollars, Jr. of 805 Wheelis Way, LaGrange, GA 30240 make this statement from my own personal knowledge. I am inventor of the invention set forth in the above referenced patent application.

2. My educational background is that I received a Bachelors degree in Biology / Chemistry from the University of Alabama in 1974. Further, I have achieved the status of being duly elected by my peers in the Airbag Industry, and currently serving as Chairman of ASTM (American Society for Testing and Materials) sub-committee D13.20 for Inflatable Restraints (airbags).

3. I am employed as a Research Engineer in the Automotive Airbag Research Group for Milliken & Company ("Milliken") in La Grange, Georgia. I have personal knowledge of the facts stated in this Declaration.

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4. I am very familiar with my invention. The invention, in one embodiment, includes an airbag cushion structure of interconnected woven in joints that resist gas permeation, the structure having between the first and second interconnected joints with 2-4 yarns in the first layer and 2-4 yarns in the second layer. Thus, in the invention, woven in joints are provided with a total of between 4 and 8 yarns per two-layer structure between joints, i.e. counting both the top and bottom layers between interconnected joints. One such embodiment of the invention is illustrated in my patent application in Figures 5-6. The use of closely spaced joints is useful in forming flow barrier elements in the airbag cushion, as described on page 15 of the patent application specification. Such a structure resists gas leakage, and retains gas pressure for longer periods of time.

5. Further, I have reviewed Japanese Utility Model 50.[1975] - 145875 to Katsutoshi Ando et al. (hereafter "the Japanese 875 patent"). I have seen Figure 2 of that patent disclosure, in which an airbag is shown with a weave that includes twelve total (12) yarns, the structure having six (6) yarns in each layer of a two layer structure, between interconnected joints, for a total of 12 yarns.

6. Upon learning of the rejection of my patent application based upon the Japanese 875 patent, I did some testing of the seams of the invention, as compared to seams as shown and disclosed in the Japanese 875 patent. I made special airbags using the so-called "cross-over" seam of my invention, having interconnected joints as described and claimed in my patent application. Airbags were made with 4 total yarns (2 per side) between interconnected joints as a representative example of the invention. Furthermore, other comparative airbags were made in the same manner, but with 12 total yarns (6 per side) between interconnected joints to represent the Japanese 875 patent embodiments. Two iterations of bag shapes and sizes were produced. One bag is relatively small and is a size and shape useful for development work in a laboratory scale, but with features typical to curtain bags. The other bag shape chosen is a full size curtain bag as currently being sold into the market for installation into a vehicle.

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These samples were produced alternating and adjacent within the same piece of fabric to ensure that both the seam variations of the invention and the Japanese 875 teachings were produced and processed under essentially identical conditions. Two bags each, of each bag shape iteration, and of each seam type were leak tested. The pressure readings on the Y-axis of the graphs of Figure 1-2 represent the pressure experienced in the airbag over time, after pressure is applied to the airbag seam. See results in Figure 1. The full size airbag was also tested at a higher, more rigorous pressure, as shown in Figure 2.

7. In all instances, the airbags having seams with 12 yarns between interconnected joints leaked down to a lower pressure rate at a significantly faster rate as compared to the leak down rate of the seams of airbags that employed the invention, i.e. represented by use of 4 yarns between interconnected joints. It is more desirable, and the bag of greater value in the market, for the bag to retain air pressure as long as possible. A seam type that will retain pressure longer will allow the use of less coating material to achieve the required and specified leak down requirement. This savings of material translates in to product cost savings and economic advantage. These tests results are unexpected, as further described below.

8. This advantage of the invention shows even a higher relative difference at the typical 5-6 second time interval required in the industry, i.e. the seams of the invention compared to the seams shown in the Japanese 875 teachings. For example, the data showed when tested at 10.15 psi airbag pressure, at 5 seconds of elapsed time, for a full size bag, a 12 yarn wide seam showed 6.24 psi. At 5 seconds of time for the 4 yarn seam (invention), the pressure value of 7.61 was recorded. This is an increase in performance for the 4 yarn seam/airbag of the invention of about 22% improvement compared to the Japanese 875 sample.

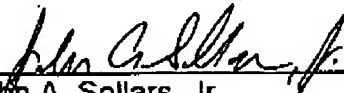
9. The higher and more rigorous starting pressure, as shown in Figure 2, of 14.5 psi, causes even greater shifting of the yarns in the undesirable Japanese 875 sample,

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with undesirable gas leakage through the seam of the Japanese sample. Further, at the 14.5 psi starting pressure, at 5 seconds, the percent improvement was about 34% when comparing the 4 yarn seam of the invention to the 12 yarn seam of the Japanese 875 embodiment. Again, these are significant and unexpected results in the difference in the ability of these two samples to retain applied gas pressure when used in an airbag. The results are due to the discovery of this new seaming arrangement.

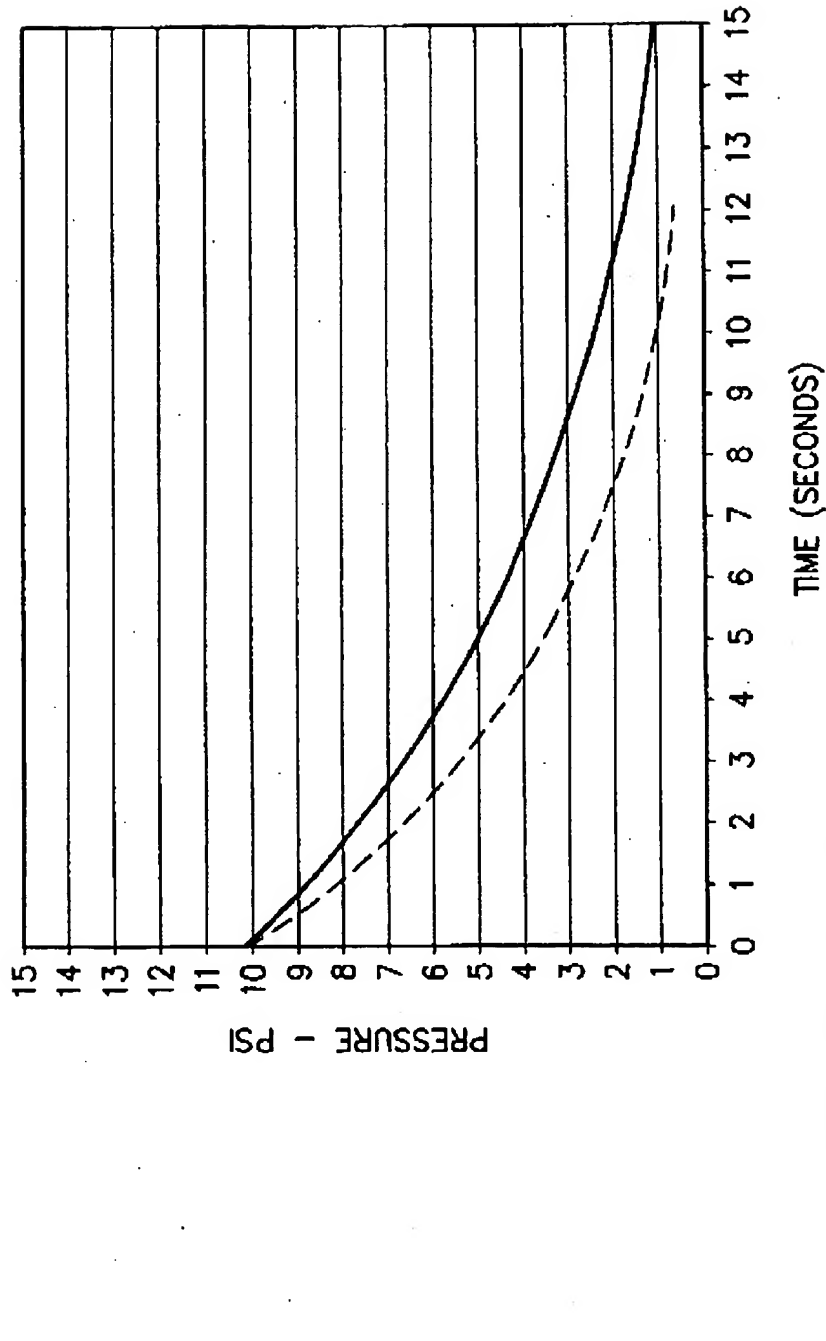
10. All statements set forth herein are made of my own knowledge and are true, and all statements made on information and belief are believed to be true. I make these statements with the knowledge that willful false statements are punishable by fine or imprisonment, or both, and may jeopardize the validity of the application or any patent issuing thereon.


John A. Sollars, Jr.

October 30, 2007
Date

1/2

COMPARISON DATA FOR DIFFERENT WEAVES STRUCTURES IN LABORATORY TEST BAG
FOUR (4) VERSUS TWELVE (12) TOTAL YARNS BETWEEN WOVEN IN JOINTS
BLEED DOWN RATES - AVERAGE OF 2 TESTS



— 4 YARNS FROM 10.15 PSI
--- 12 YARNS FROM 10.15 PSI

TIME (SECONDS)

Figure -1-

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COMPARISON DATA FOR DIFFERENT WEAVES STRUCTURES IN FULL SIZE AIRBAG CUSHION
FOUR (4) VERSUS TWELVE (12) TOTAL YARNS BETWEEN WOVEN IN JOINTS
BLEED DOWN RATES - AVERAGE OF 2 TESTS

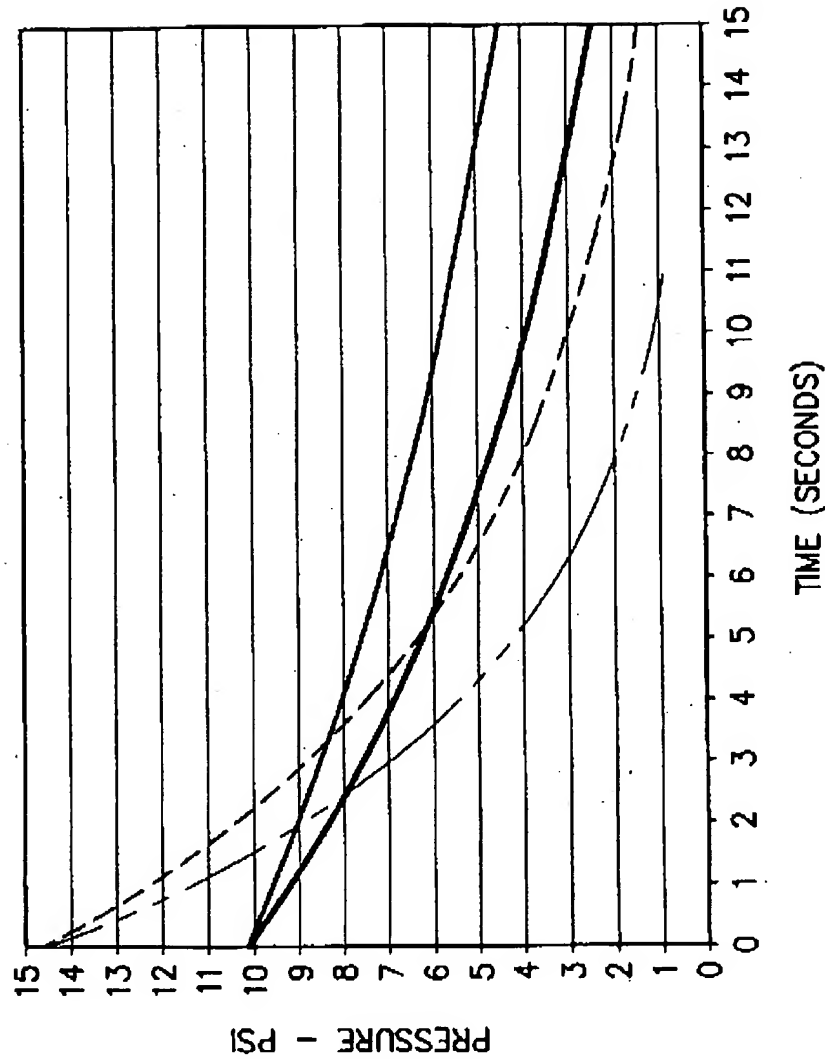


Figure -2-

— 4 YARNS FROM 10.15 PSI
--- 12 YARNS FROM 10.15 PSI
— 4 YARNS FROM 14.5 PSI
--- 12 YARNS FROM 14.5 PSI

X. RELATED PROCEEDINGS APPENDIX

None.